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Insights from reconstructed paleo ice-stream activity in Northern Central Greenland

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IGS Seminar Series
February, 8th 2023



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nature geoscience



Article

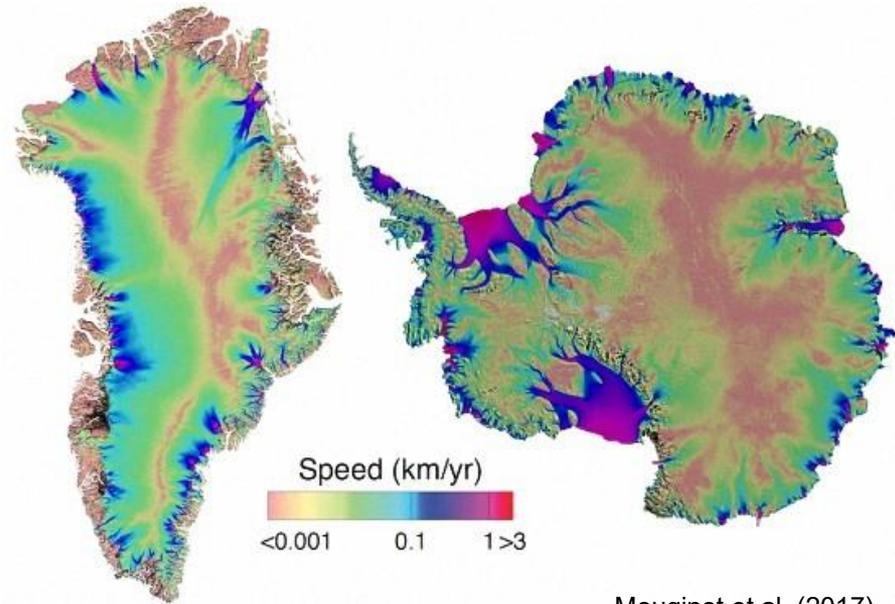
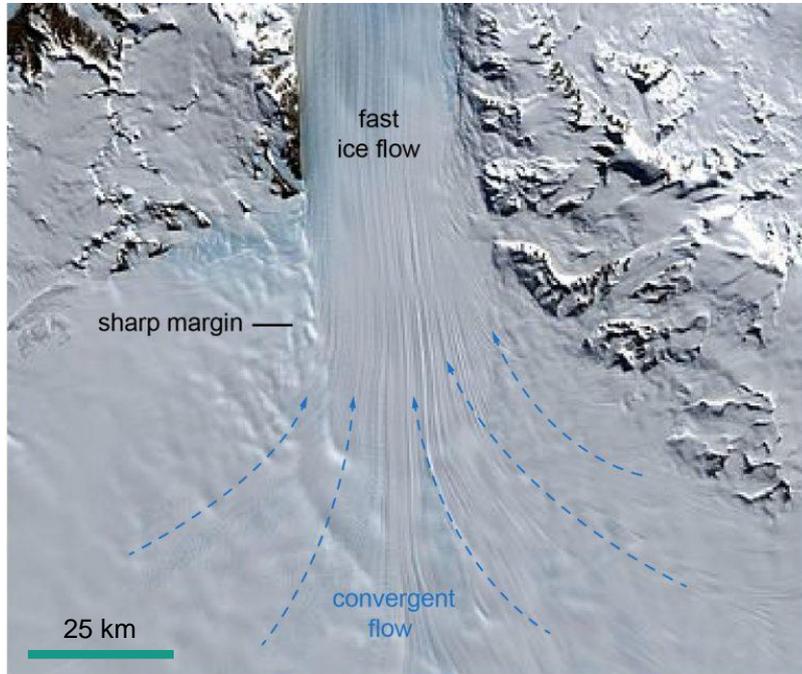
<https://doi.org/10.1038/s41561-022-01082-2>

Holocene ice-stream shutdown and drainage basin reconfiguration in northeast Greenland



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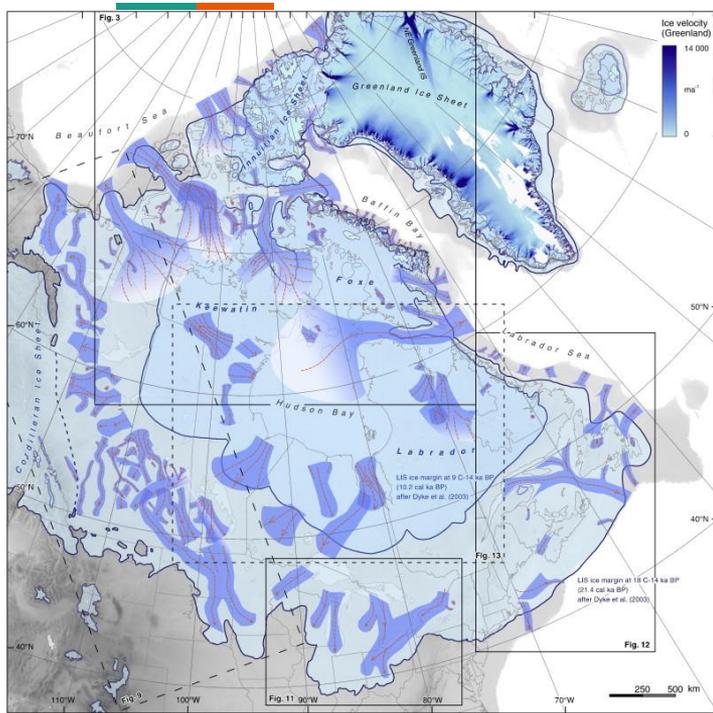
Localised ice flow (mapped from space)



Mouginot et al. (2017),

Byrd Glacier, West Antarctica. Image taken from NASA.

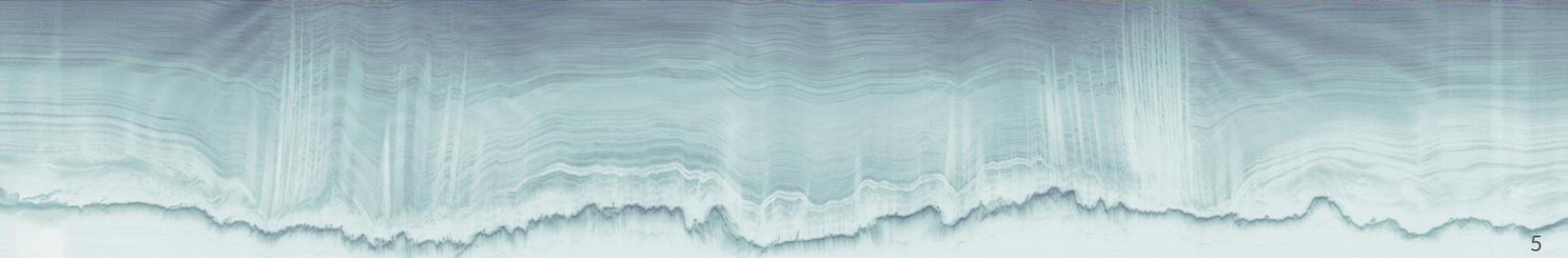
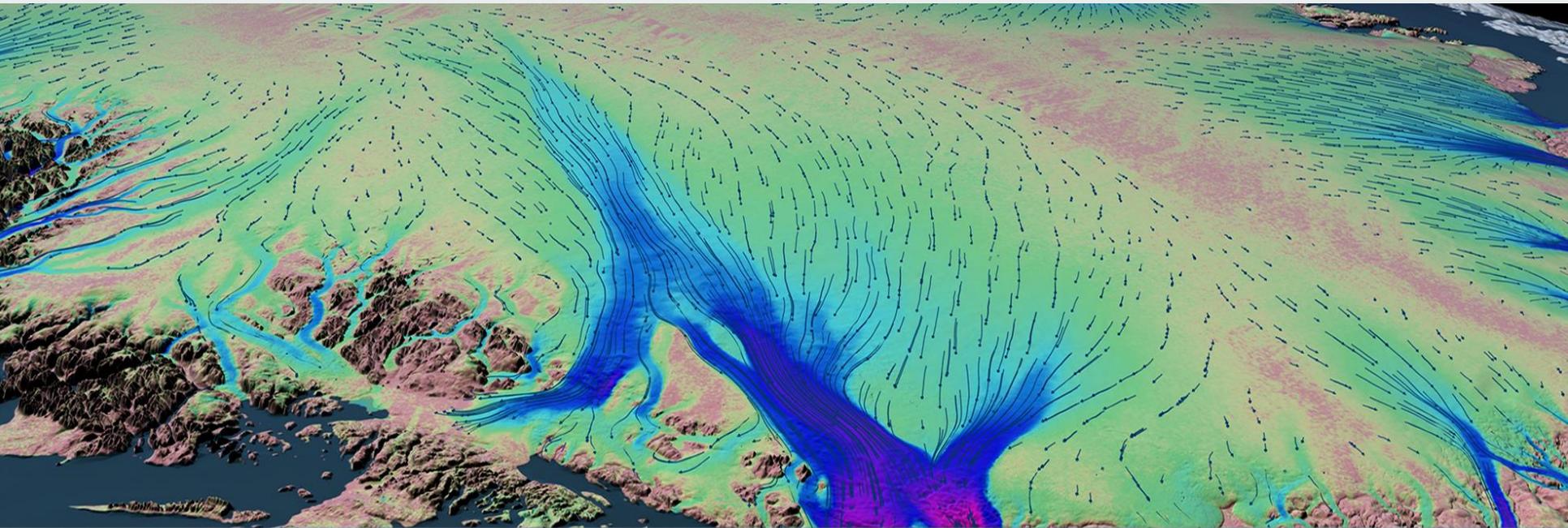
Ice stream reconstructions



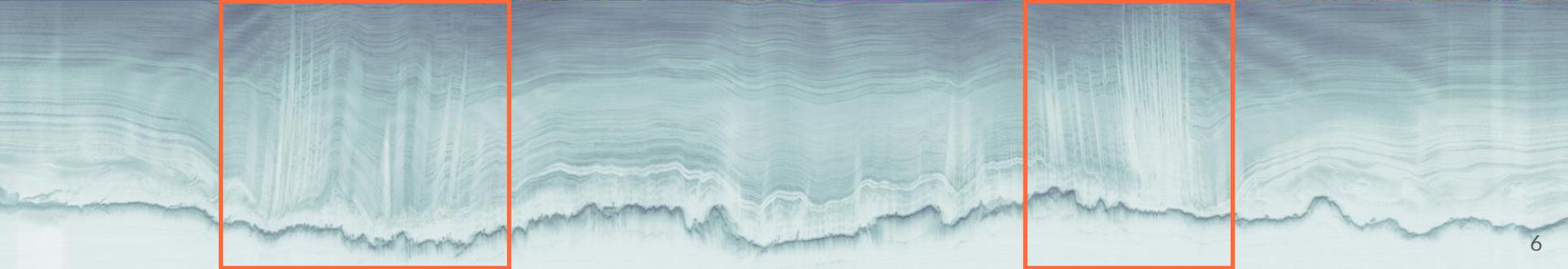
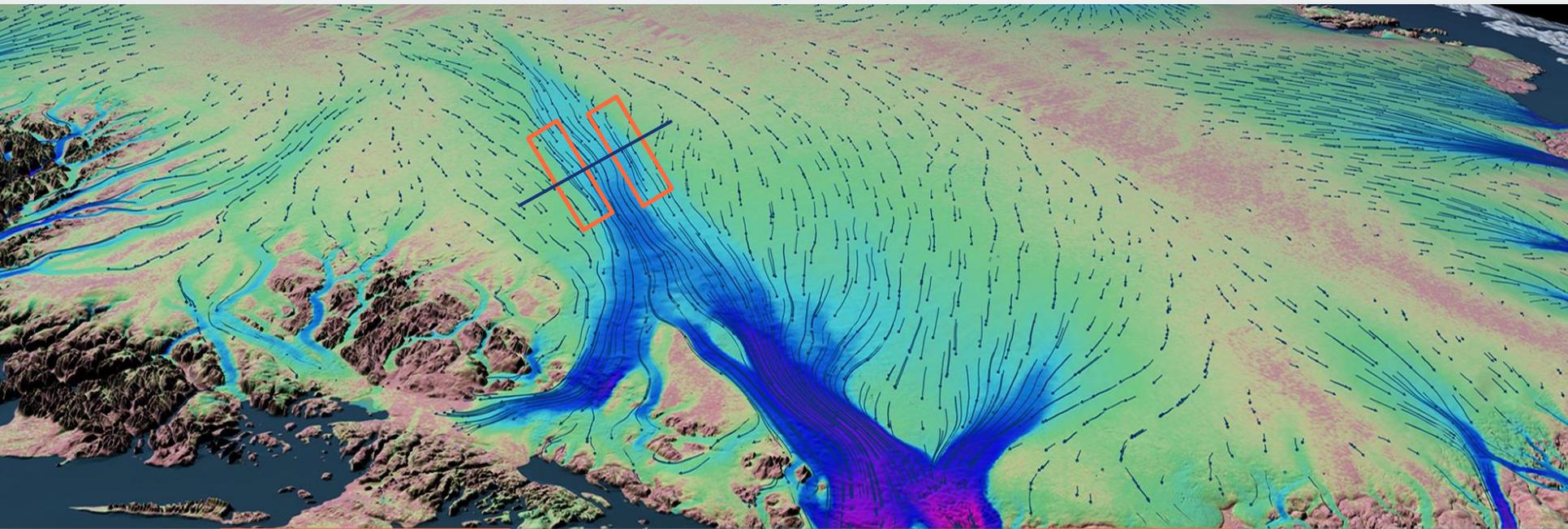
Stokes et al. (2016)

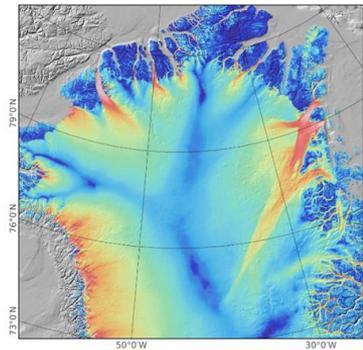
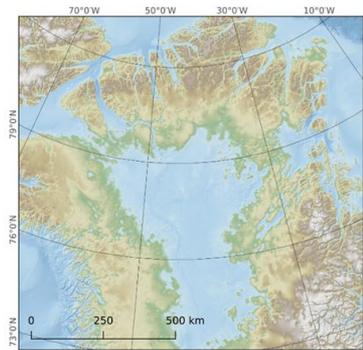
Image from <http://www.antarcticglaciers.org> (Google Earth)

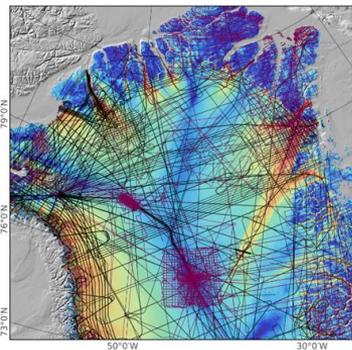
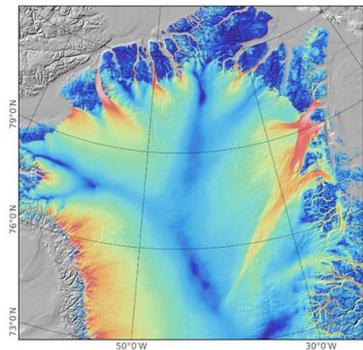
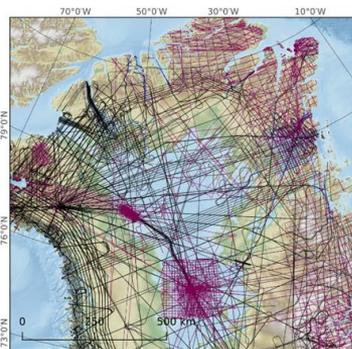
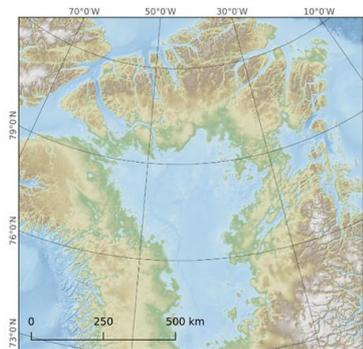
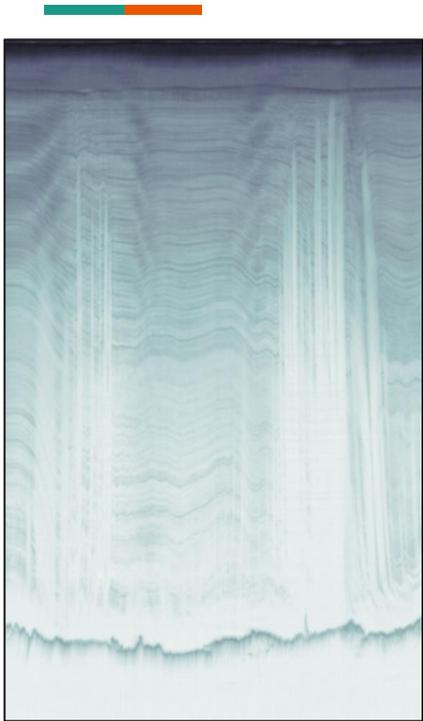
NEGIS shear margin radio-echo sounding signature

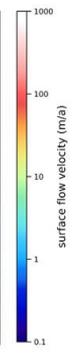
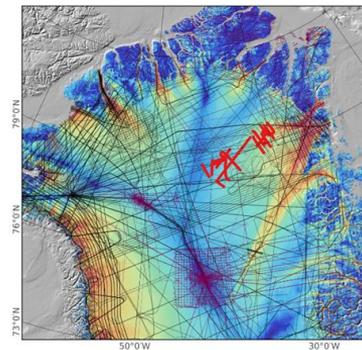
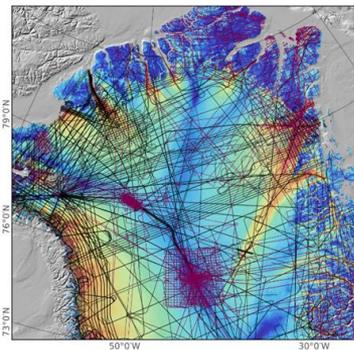
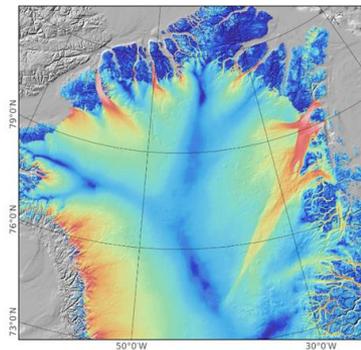
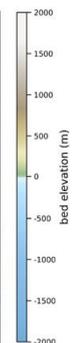
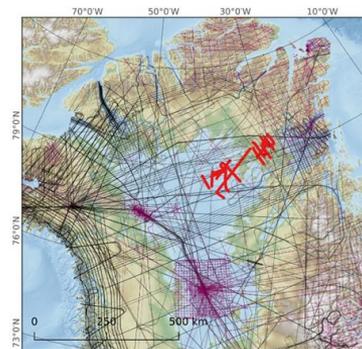
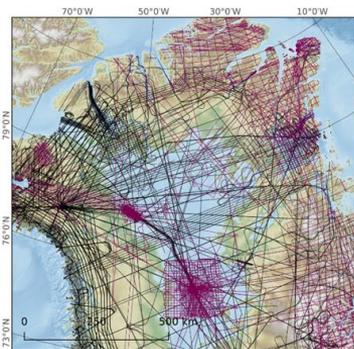
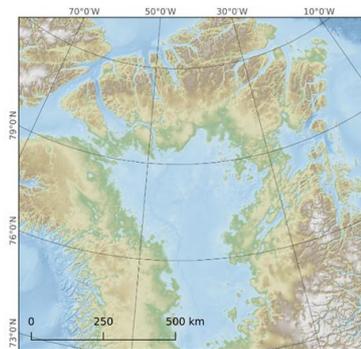


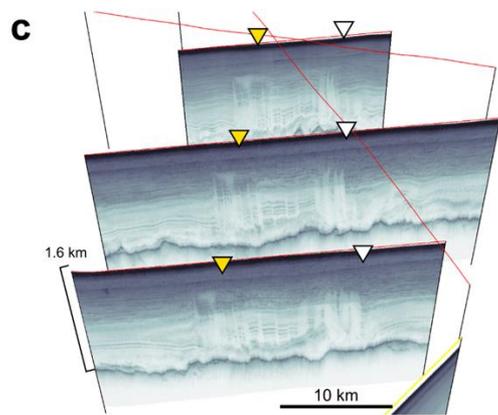
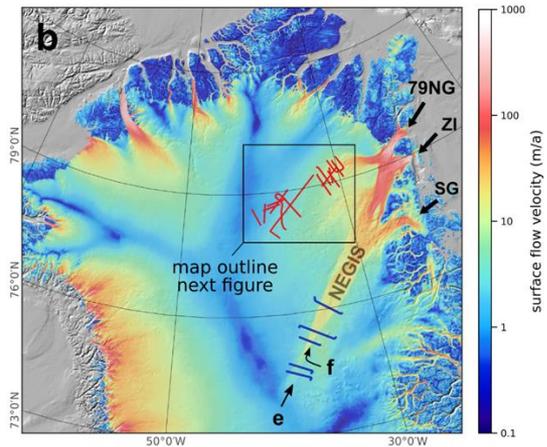
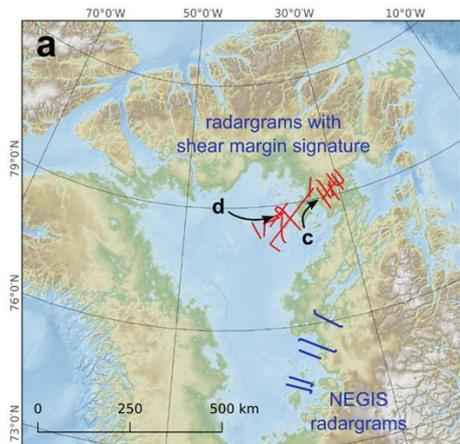
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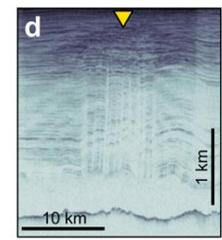


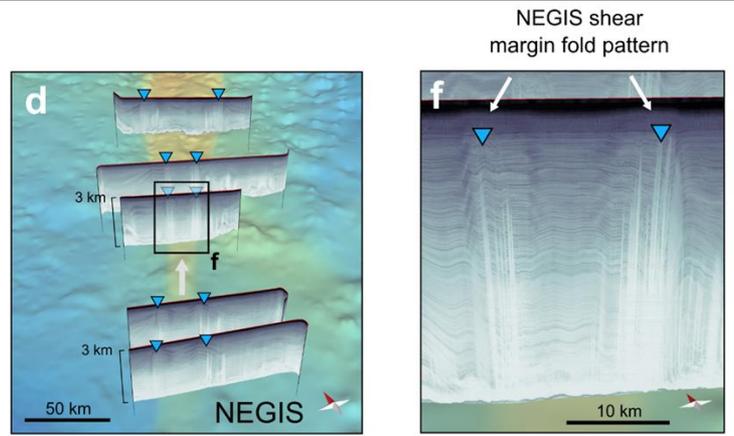
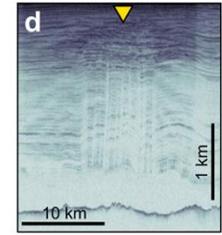
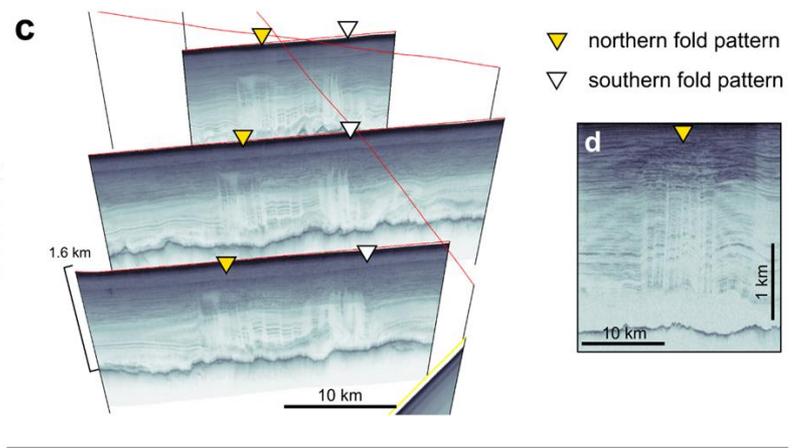
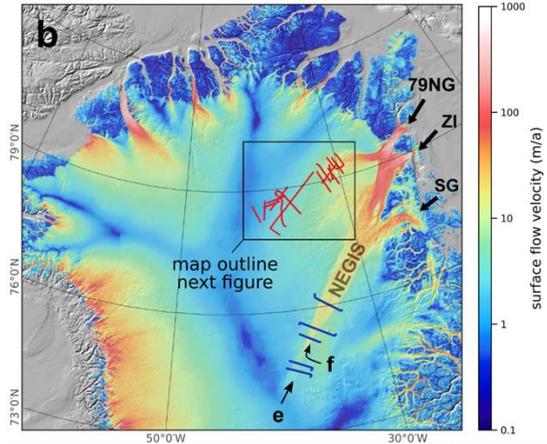
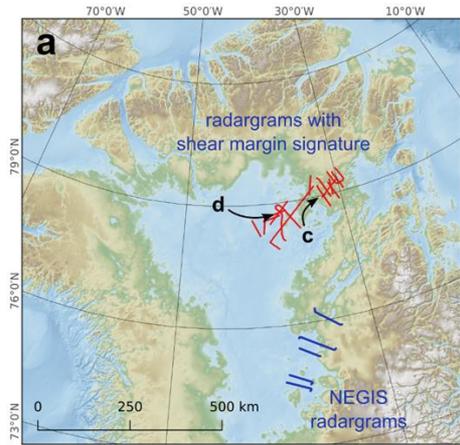


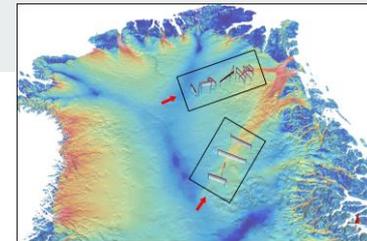




- ▼ northern fold pattern
- ▽ southern fold pattern

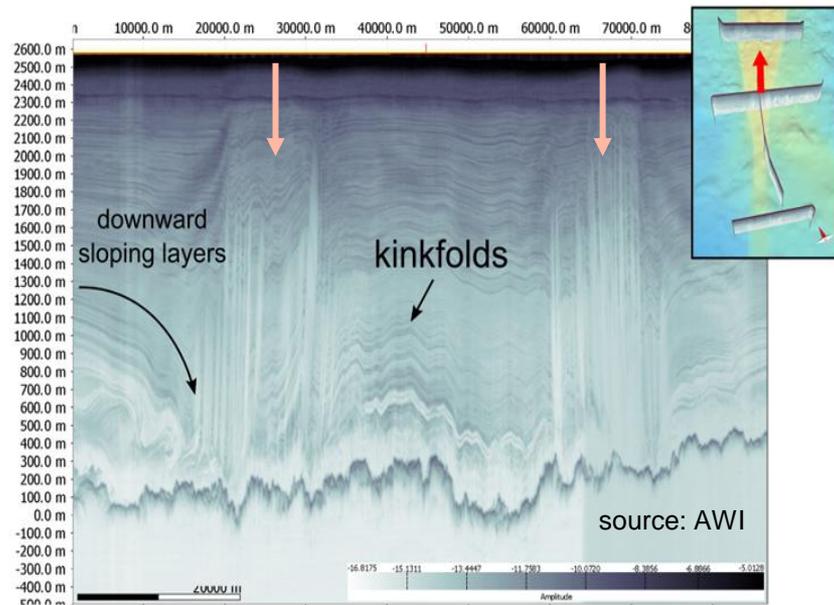
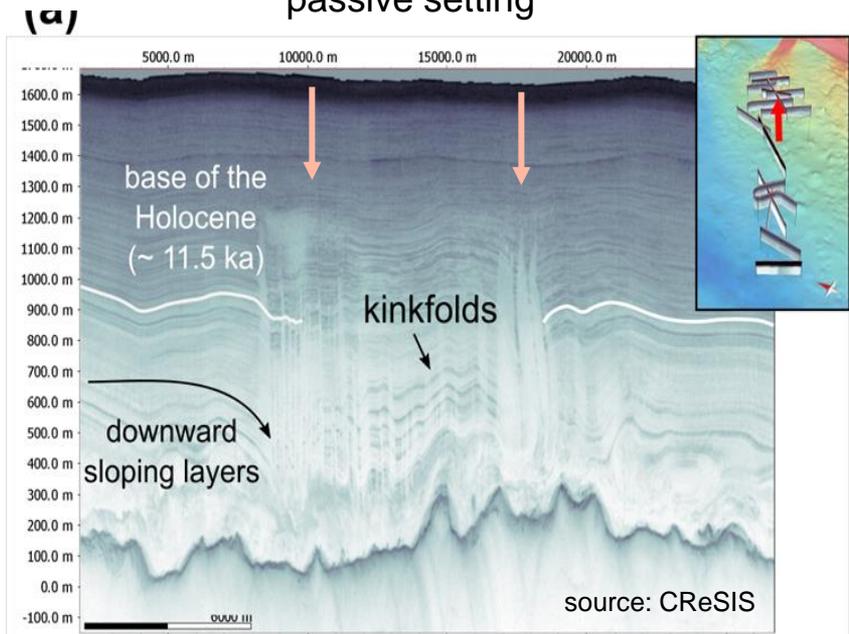




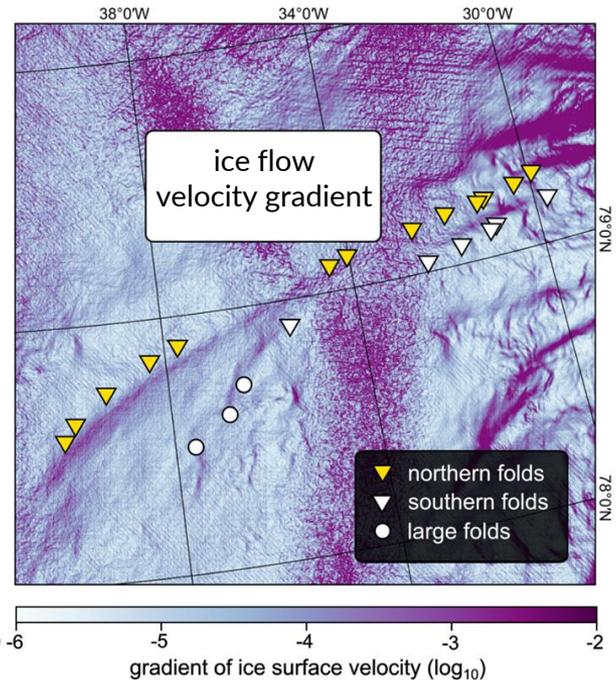
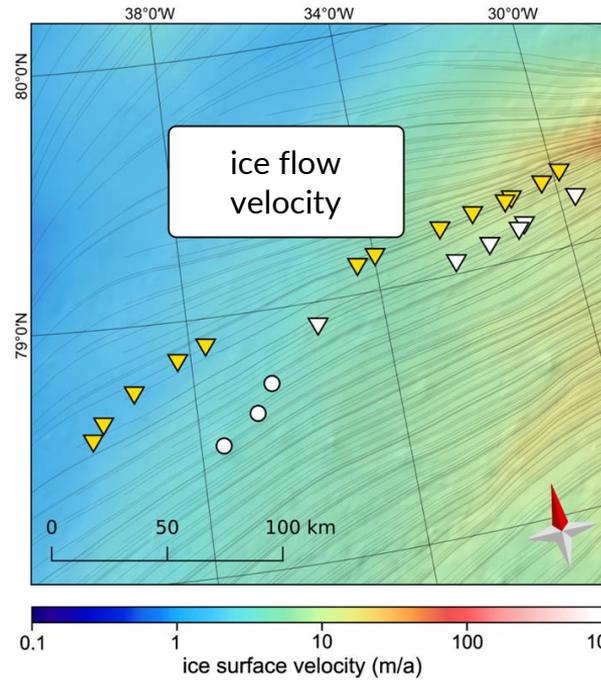
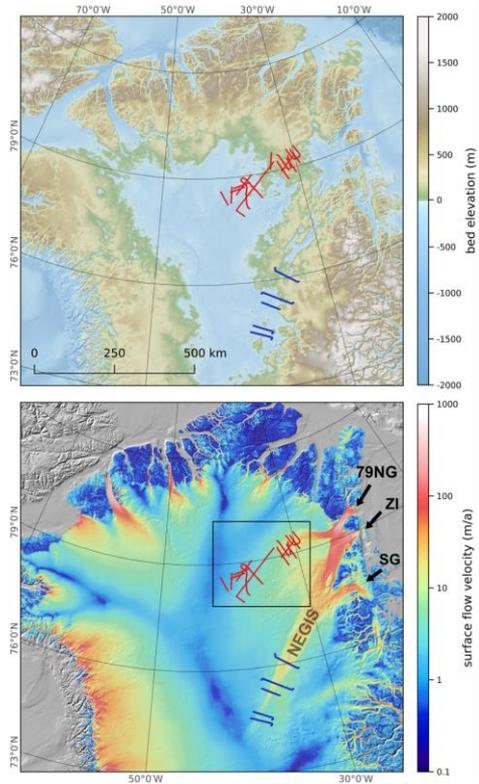


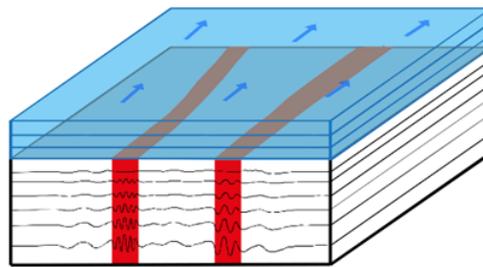
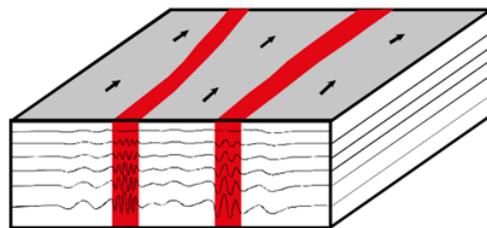
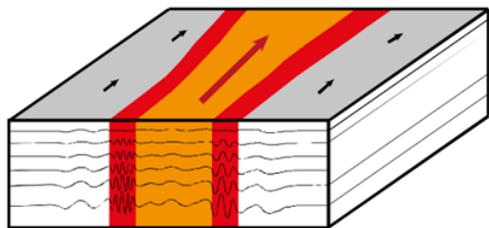
passive setting

NEGIS - active setting



Ice-stream signature but no ice stream

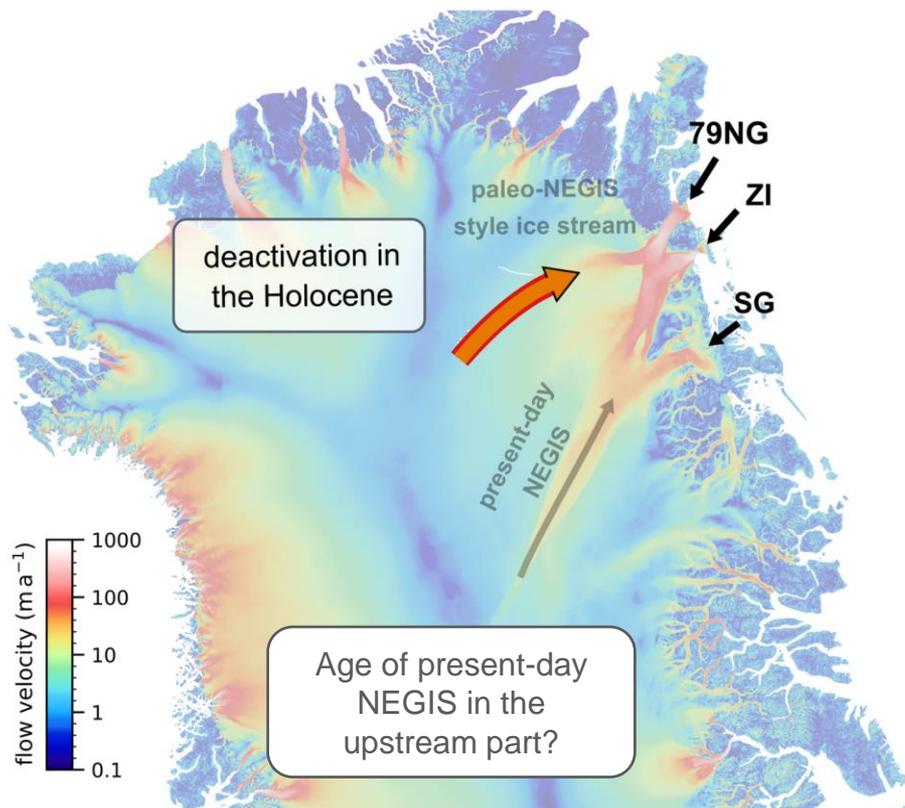


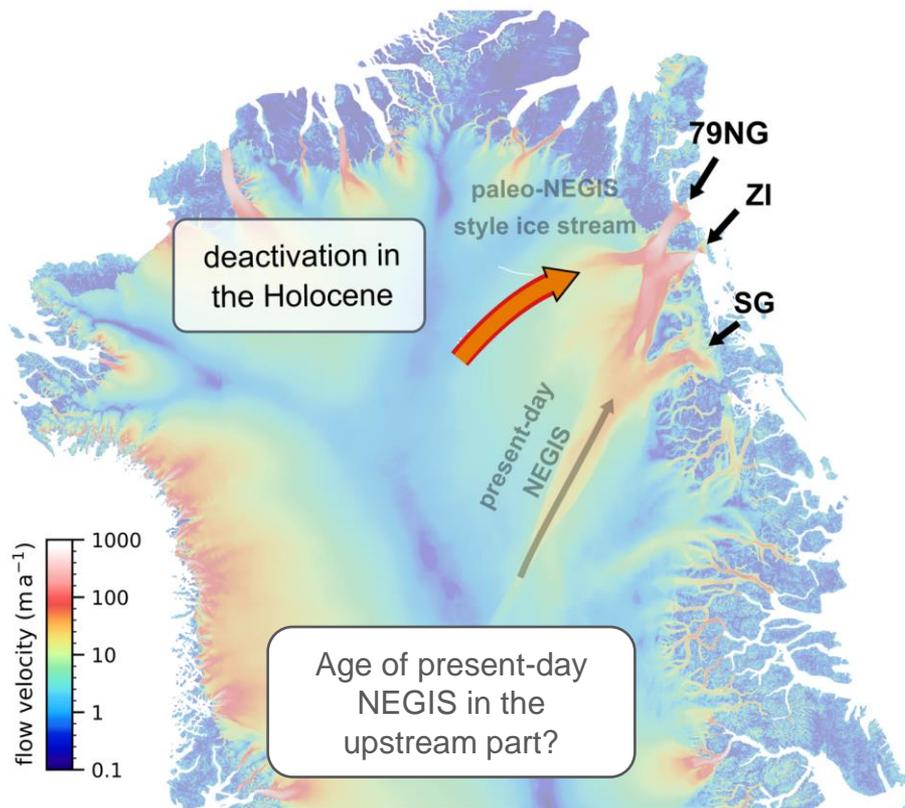


a) Past condition: active ice stream (orange) and shear margins (red)

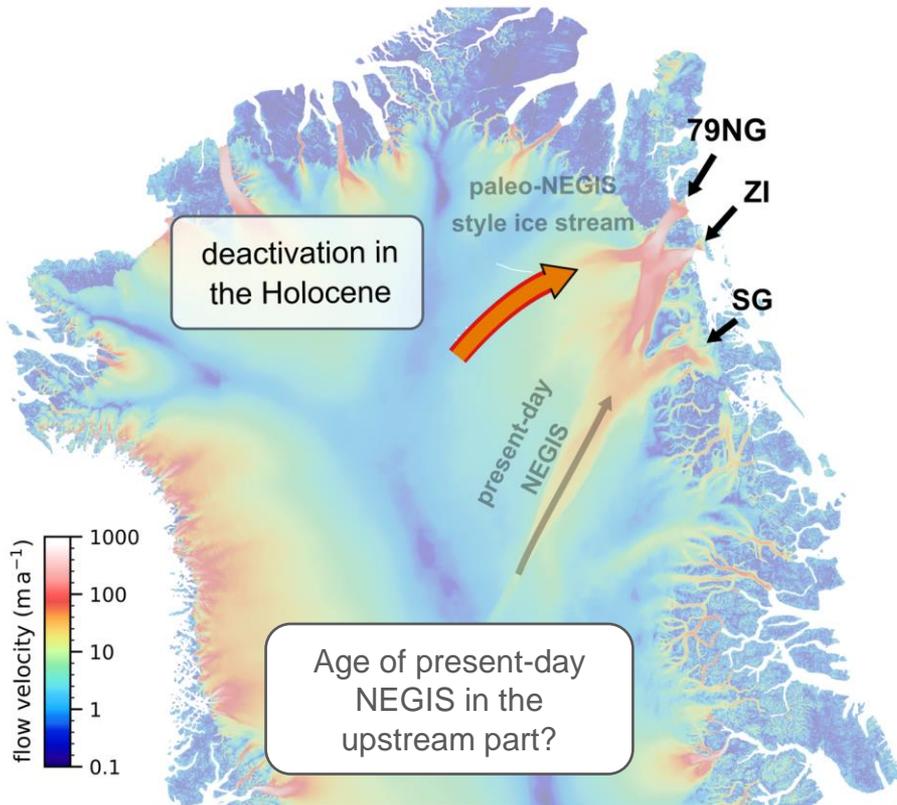
b) Later: ice stream ceases, shear margins and folds remain

c) Today: past shear margins and velocity field buried by accumulation and new layers (blue)

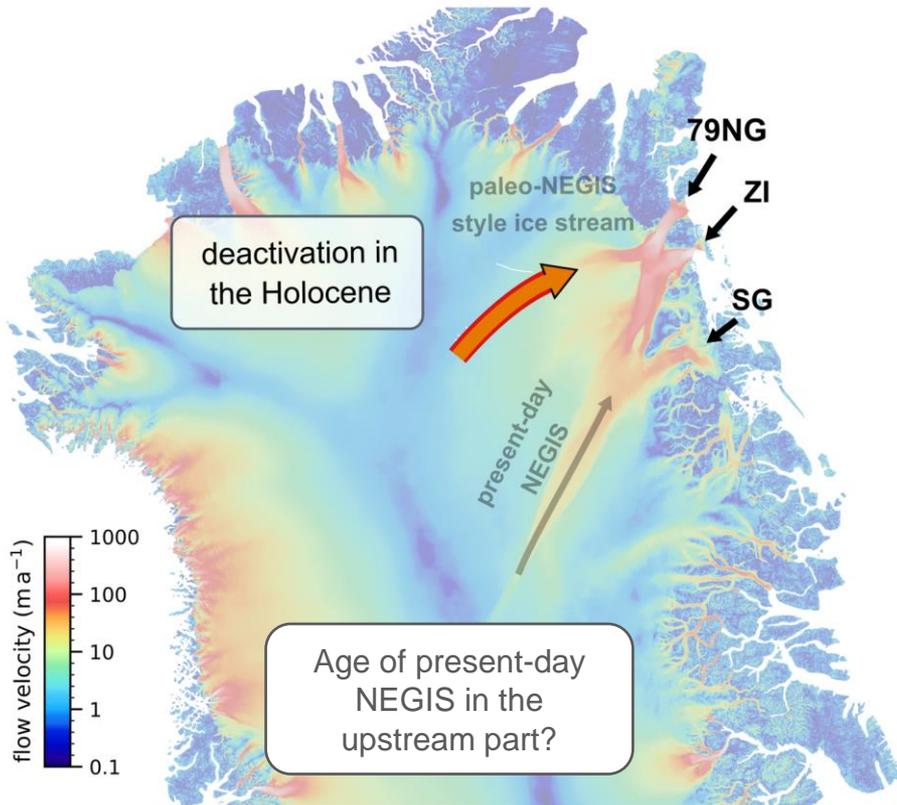




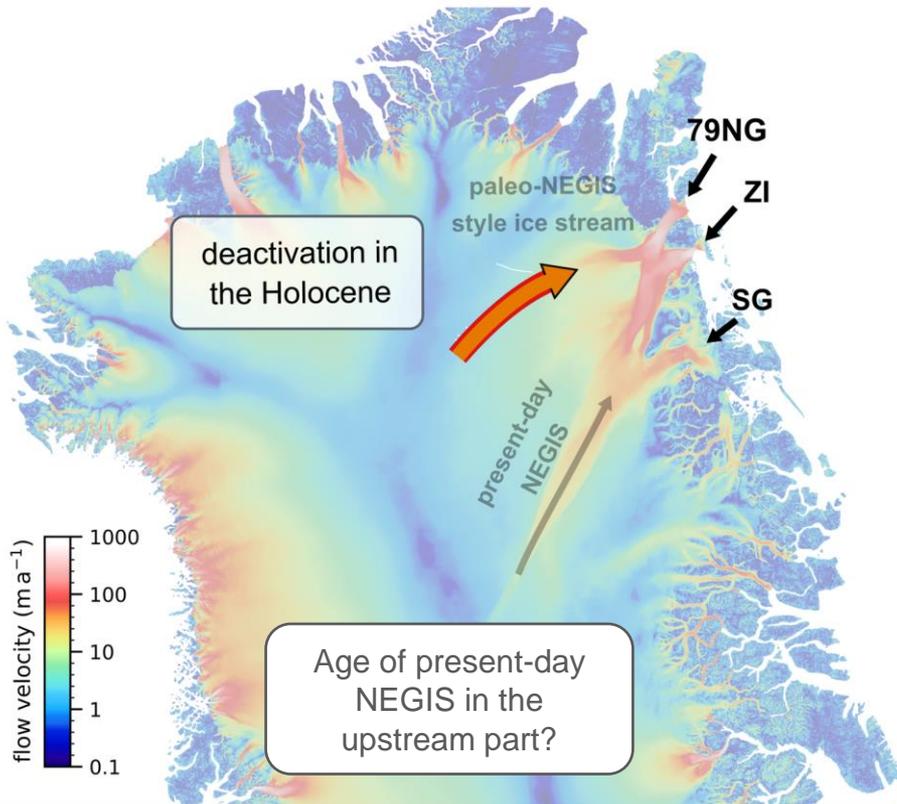
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NEGIS-style ice streams come and go?



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- **Signature in the velocity gradient**
Deactivated recently or indication of reactivation?

